

graphing the family Scrophulariaceæ in De Cardolle's *Prodromus* (1846), grouped these species with a few others as a subdivision *Pentasepalæ* of the section *Chamædrys*, characterised and distinguished from other subdivisions, and the majority of the species of the genus, by the five-toothed calyx as contrasted with the usual four-toothed organ. The disappearance, by gradual reduction, of the median sepal is one of the factors in the diminution of the zygomorphy, which is a feature of the *Veronica* flower when compared with the more strikingly zygomorphic forms typical of the family. These pentasepalous forms are to be regarded as an older type from which the more numerous tetrasepalous have been derived, and Dr. Watzl again directs attention to the fact that the character is a variable one, four-sepalled flowers being of frequent occurrence.

None of the three species which are the subject of the memoir occurs in the British Isles, but they are widely distributed in central and southern Europe. *Veronica prostrata* is the most constant of the three; besides the type only one form and one variety (from Siberia) are recognised. There is, however, a considerable amount of variation in habit, degree of hairiness, and size of parts; and, as shown by plate v., the leaf displays great variety in size and form in specimens from different localities. The other two species are remarkably polymorphic, and are subdivided by the writer into a series of subspecies, varieties, and forms, with, in several cases, a number of transitional forms between the different subspecies. Dr. Watzl has made a careful and exhaustive study of a large series of specimens from central and southern Europe, as well as of the citations in the numerous European floras, and the results of his work will have a special interest for the critical student of the European flora. It is inevitable, however, that the personal element should enter into such a detailed study of a highly variable species occurring over a somewhat extended area, and it is probable that other critical students of the same group would not entirely concur with the limitations of forms and varieties which are adopted by Dr. Watzl. A. B. R.

SCHOOL DRAWING.

- (1) *A Course of Drawing for the Standards. Being a Selection of Sheets from "A Complete Course of Free-Arm and Industrial Drawing."* By J. W. T. Vinall. Pp. 24+xxiv charts. (London: Blackie and Son, Ltd., 1910.) Price 6s. net.
- (2) *Natural and Common Objects in Primary Drawing, with Full Directions as to Their Use. A Handbook for Teachers.* By J. W. T. Vinall. Pp. v+68. (London: Blackie and Son, Ltd., 1910.) Price 3s. 6d. net.

(1) THE issue of the author's "Complete Course of Free-Arm and Industrial Drawing," in sections is a wise step that will be much appreciated by teachers. The first portion, published as "A Course of Kindergarten Drawing, for Infants and Small Children," has now been followed by a second and more advanced selection under the title given above. It

outlines a progressive school course for youths from six years upwards, corresponding to standards I. to VII. and beyond. The first six plates deal with brush work and the principles of colour harmony, with applications to natural objects and ornamental designs. The next six illustrate a well-graded course of free-arm drawing in coloured chalks, based on circular, elliptic, and compound curves. The applications to natural and familiar objects, to ornamental patterns and designs, with reference to the laws of growth, repetition, and radiation, are very numerous and intensely interesting. The remaining charts comprise free-hand drawing in pencil, crayon, and with the pen; further brush work and shading; and model and perspective drawing, with technical and other applications. The plates are accompanied by a very lucid and suggestive description that will prove most valuable to teachers. They are beautifully executed, generally in colours. As a whole, the work forms as admirable a course of school drawing as could be desired, and impresses the reader with the great educational value of training conducted on lines indicated by the author.

(2) This is a new work, intended to be supplementary to the one noticed above, its main object being to assist the teacher in the selection of objects, properly graded and suitable for class instruction in drawing in elementary schools. It is based on the syllabuses of the English and Scottish Boards of Education. The objects are displayed in a number of plates, to which teachers will often be glad to refer. The illustrations include familiar objects in common use, nature forms and specimens, subjects for measured drawings, and specimens of alphabets and printing. The plates are described in the text, and are preceded by a general discussion of the aims and qualifications of the teacher, of the apparatus used, and of the methods of work. The book can be recommended to teachers as affording valuable guidance in their work.

OUR BOOK SHELF.

Iron and Steel Analysis. Vol. i., Ordinary Constituents. By A. Campion. Pp. 80. (Glasgow: Fraser, Asher and Co., Ltd. 1910.)

THIS small handbook gives a detailed account of the methods used in determining the six or seven elements invariably occurring in pig-irons and ordinary steels, and also those employed in the proximate analysis of coal.

With few exceptions, one method only is described for each element, and in every case one which has been in use (with modifications) in steel-works' laboratories for many years. Although, therefore, there is nothing new by way of contribution to the existing literature on the subject, the book is eminently suited to beginners. It is doubtful, however, whether the author's hope that works chemists will find the book useful will be realised, as some of the methods described are by no means quick enough. Rapidity, consistent with accuracy, is a very important consideration in steel-works laboratories, a fact which the author obviously recognises in the preface.

The opening out of grey irons with hydrochloric acid in silicon determinations, as described in this

book, has been largely superseded by the more rapid and trustworthy process of Drown. The gravimetric methods described for manganese and phosphorus are cumbersome. In the case of the former, the importance of neutralising the acid solution of ferric and manganese chlorides at a boiling temperature is wrongly insisted upon, and the washing of the voluminous basic ferric acetate precipitate should have been avoided.

Manganese furnishes one of the cases in which alternative volumetric methods are described, the first of which is undoubtedly more accurate than the gravimetric method as carried out by the author. An alternative process, preferably volumetric, for the determination of phosphorus, would have materially increased the value of the book. The other elements, and particularly the most important one (carbon), are dealt with in a very satisfactory manner. F. I.

The Potter's Craft. A Practical Guide for the Studio and Workshop. By F. Binns. Pp. 171. (London: Constable and Co., Ltd., 1910.) Price 6s. net.

THE preface leads to great expectations, for the author says:—"This book is the outcome of an experience extending over a period of thirty-six years. Twenty years ago it would have been impossible for the science of ceramics was not then born." The book itself is, however, very disappointing, and cannot be considered as a serious contribution to ceramic science. It is written apparently for the amateur potter; it certainly would not be of use to anyone else, and there is nothing in it that was not known twenty years and more ago.

Much of the book is taken up with photographs and descriptions of two well-known processes, viz., "mould-making" and "throwing." These could be much better learnt and understood by a visit to a pottery; certainly no one will ever learn to be a craftsman by studying the book. When one knows the time it takes for a professional potter to learn to throw even simple small pieces to a given size, it seems almost ludicrous to write as the author does of an amateur making vases two or three feet high by doing the work in sections. The chapter on glazes and glazing can lead to nothing but disappointment.

It is hard to believe that the author has had great practical experience when we see him trying to deal with "the defects of glazes" in about two pages. For example, practical men know what a difficult problem "the pinholing of glazes" is, and how many and varied are the causes which produce it. Mr. Binns devotes two lines to it!—"Pinholes appear in the glaze when cool. Too rapid cooling is the cause." It is difficult to write with patience of this kind of treatment, particularly when we remember the preface.

Heroes of the Elizabethan Age. Stirring Records of the Intrepid Bravery and Boundless Resource of the Men of Queen Elizabeth's Reign. By E. Gilliat. (London: Seeley and Co., Ltd., 1911.) Price 5s.

THE stout-hearted men who sailed the seas in the days of England's awakening were indeed heroes. Their charts were made with the degrees of longitude at different latitudes of equal length; they were inaccurate even as regards the shores of the English Channel, for it is one of the claims to renown of John Davis that he surveyed the Channel coasts in addition to those of the Arctic, of Magellan Straits, and of the Scilly Isles. They dared to cross the Atlantic in tenton vessels, for the *Squirrel*, in which Sir Humphrey Gilbert was lost, was of this size; they took five months on the voyage to the Cape of Good Hope, and the chances were that disease alone would kill off a

large proportion of the crew of every vessel which went on a protracted voyage.

Englishmen fitted out expedition after expedition; many times for no return, sometimes for a return of hundreds per cent. on their outlay, for the capture of one rich carrack might suffice to pay the cost of a large expedition. In this atmosphere Hawkins began the slave trade, Sir Richard Grenville fought his good fight off the Azores, and Howard and his captains harassed the Armada and made its efforts fruitless. In this spirit Sidney died at Zutphen. These heroic efforts form part of the great struggle for Protestantism which lies at the background of the life-story of the thirteen heroes as depicted in this splendid gift-book by a sometime master at Harrow School. Well illustrated and produced, this book will delight the heart of most boys and many girls, even those of somewhat mature age. B. C. W.

International Language and Science. Considerations on the Introduction of an International Language into Science. By Profs. L. Couturat, O. Jespersen, R. Lorenz, W. Ostwald, and L. Pfaunder. Translated by Prof. F. G. Donnan. Pp. ix+87. (London: Constable and Co., Ltd., 1910.) Price 2s. net.

Internaciona Matematikal Lexiko en Ido, Germana, Angla, Franca e Italiana. by Dr. Louis Couturat. Pp. 36. (Jena: Gustav Fischer, 1910.) Price 1.50 marks.

THE first of these books is an English edition of a work the German edition of which was reviewed in NATURE for August 19, 1909. The translator is Prof. F. G. Donnan, of Liverpool University. The "Internaciona Matematikal Lexiko," by Dr. Louis Couturat, contains all the technical terms commonly used in mathematics. The language of the International Commission constitutes in many respects a great advance on its predecessors. If there is one feature that possibly calls for improvement, it is that the new language is not based on Latin as much as it might be, in view of the fact that Latin is taught in schools in every civilised country. By adopting the Latin vocabulary free from all unnecessary grammatical technicalities, the need of a new language could have largely been obviated. It is true that a large proportion of the words are taken from Latin, but there are exceptions, such as "lasta" for ultimate, "samcentra, sam-foka," and so forth, for concentric and confocal, "ringo" for annulus, and "helpanta" for auxiliary.

The Presentation of Reality. By Dr. Helen Wodehouse. Pp. x+163. (Cambridge: University Press, 1910.) Price 3s. net.

IN this little book Dr. Wodehouse (who is lecturer in philosophy in the University of Birmingham) attempts a description of knowledge from the point of view of a philosophical psychology. She avoids metaphysics as far as possible, but maintains that in all cognitive experience we come into immediate contact with objective reality, of the existence of which we have in experience an irrefutable witness, and that on all levels of cognition, sensuous or intellectual, this happens in the same way, namely, by the presentation of an object to a subject.

The author's metaphysical inclinations seem to be towards the school of Reid, while among recent writers her affinities are with Dr. James Ward, Dr. G. F. Stout, and Dr. A. Meinong. Bradley on the one hand, and James on the other, come in for acute criticism, Dr. Wodehouse believing strongly—as against the great pragmatist—that reality does not wait for our thinking to make it, though the discovery of reality does; that some discoveries can be made, and that it